

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 13

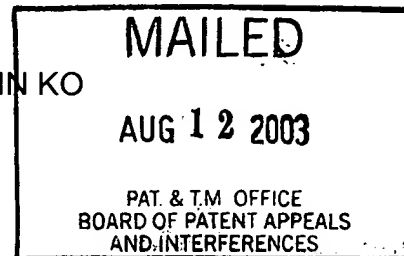
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JEFFREY A. SHIELDS and KELWIN KO

Appeal No. 2001-2312
Application No. 09/208,325

ON BRIEF



Before BARRETT, RUGGIERO, and BLANKENSHIP, Administrative Patent Judges.

BLANKENSHIP, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 3, and 4.

We affirm-in-part.

BACKGROUND

The invention relates to a method of manufacturing semiconductor devices in which a layer of TiN (titanium nitride), formed on a surface of metal structures, is removed after metal etch. Claim 1 is reproduced below.

1. A method of manufacturing a semiconductor device, wherein the method comprises:

forming a final layer of metal on a layer of interlayer dielectric in the semiconductor device;

forming a layer of TiN on the final layer of metal;

forming a first layer of photoresist on the layer of TiN;

patterning and developing the first layer of photoresist exposing portions of the layer of TiN;

etching holes in the layer of TiN and the final layer of metal exposing portions of the interlayer dielectric, wherein metal structures are formed;

removing the first layer of photoresist;

removing remaining portions of the layer of TiN; and

forming a blanket layer of interlayer dielectric on the surface of the semiconductor device.

The examiner relies on the following reference:

Xing et al. (Xing)

5,880,026

Mar. 9, 1999
(filed Dec. 16, 1997)

Claim 1 stands rejected under 35 U.S.C. § 102 as being anticipated by Xing.

Claims 3 and 4 stand rejected under 35 U.S.C. § 103 as being unpatentable over Xing and appellants' admitted prior art ("the APA").¹

Claim 2 has been canceled.

Claim 5 is objected to as depending from a rejected base claim. The examiner, in the Examiner's Answer, has expressly withdrawn an earlier rejection of the claim.

We refer to the Final Rejection (Paper No. 5) and the Examiner's Answer (Paper No. 10) for a statement of the examiner's position and to the Brief (Paper No. 9) for appellants' position with respect to the claims which stand rejected.

OPINION

As a preliminary matter, we note that appellants submit arguments in the Brief alleging that the examiner's refusal to enter a proposed amendment was improper. However, as the examiner indicates in the Answer, a challenge to the propriety of an examiner's refusal to enter an amendment is a matter for petition, rather than appeal. See Manual of Patent Examining Procedure (MPEP) §§ 1002.02(c) and 1201 (8th ed. Aug. 2001); MPEP §§ 1002.02(c) and 1201 (7th ed. Jul. 1998). We thus turn to the merits of the rejections that have been appealed.

¹ The Final Rejection and the Examiner's Answer list claim 1 as being rejected under 35 U.S.C. § 103, in addition to the rejection under 35 U.S.C. § 102. However, in view of the examiner's findings in support of the rejections, we conclude that the rejection of claim 1 is based not on alternative theories with respect to anticipation and obviousness, but solely on anticipation.

The examiner finds, as set forth on pages 3 and 4 of the Answer, that instant claim 1 is anticipated by Xing. Appellants assert the finding of anticipation is in error. In particular, appellants challenge the examiner's reading of the forming of the "final layer of metal" on Xing's formation of structures 210, 230, 240, and 250, shown in Figure 2A.

Xing refers to a "barrier/adhesion layer" 250 over an underlying oxide layer 270. An intermediate (TiN) layer 230 separates two aluminum layers, 240 and (sacrificial layer) 210. An antireflective coating layer 205 (TiN) is formed on the top layer of aluminum 210. Photoresist 200 is stripped later in the process, and sacrificial layer 210 is removed (Fig. 2B). Col. 2, l. 56 - col. 3, l. 26.

Appellants' arguments do not persuade us that the examiner's reading of the "final layer of metal" on the indicated structures is unreasonable. Claim 1 does not preclude the "final layer," as broadly claimed, from being formed of different component sub-layers.

Appellants argue (Brief at 3) that none of the structures described by Xing is the final layer "as it is defined in the present application." Appellants do not point out where any definition of the "final layer" may be found in the present application.

Detail with respect to composition of the "final metal layer" in the instant specification appears to relate to that shown in prior art Figure 1A. Final metal layer 104, typically formed from aluminum, is "a layer of metal that will be etched to form conductive interconnects from one portion of the semiconductor device 100 that will

form pads that will be connected to external structures during the gold wire bonding process.” (Spec. at ¶ bridging pp. 1 and 2.)

We agree in substance with the examiner’s position. Appellants’ allegations (Brief at 4) that Xing deals with the “manufacture of interconnects” and fails to contemplate a “gold wire bonding process” are essentially irrelevant in view of the scope of instant claim 1. Claims are to be given their broadest reasonable interpretation during prosecution, and the scope of a claim cannot be narrowed by reading disclosed limitations into the claim. See In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); In re Prater, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969). We do not consider appellants’ arguments to be commensurate with the scope of the invention that is claimed.

We further consider appellants’ allegation (Brief at 4) that Xing fails to show removing the remaining portions of the layer of TiN to be misplaced. According to the rejection, the claimed layer of TiN formed on the final layer of metal, which is ultimately removed, corresponds to TiN layer 205 in Figure 2B of Xing, shown to be removed during subsequent parts of the process (compare Fig. 2C).

Finally, with respect to the rejection for anticipation, appellants’ arguments relating to Xing’s alleged failure to show removing the layer of photoresist and the remaining portions of the layer of TiN “in the same process” are either not commensurate with the claimed subject matter, or are simply off the mark. In particular,

instant claim 1 recites separate steps in removing the first layer of photoresist and removing remaining portions of the layer of TiN. The steps described by Xing are easily seen when comparing Figures 2A through 2C, showing the removal of photoresist layer 200, prior to removal of TiN layer 205.

We therefore sustain the rejection of claim 1 under 35 U.S.C. § 102 as being anticipated by Xing.

We do not sustain, however, the rejection of the dependent claims under 35 U.S.C. § 103. We agree with appellants that the statement of the rejection (Answer at 4-5) fails to properly set forth a case for prima facie obviousness. In particular, the rejection asserts that the steps admitted to be missing from Xing may be found in the APA, and are thus "known in manufacturing a semiconductor device."²

A combination may be patentable whether composed of elements all new, partly new, or all old. Rosemount, Inc. v. Beckman Instruments, Inc., 727 F.2d 1540, 1546, 221 USPQ 1, 7 (Fed. Cir. 1984). Prior art references (or teachings) in combination do not make an invention obvious unless something in the prior art would suggest the

² We add, however, that appellants have not, on this record, shown that the description relating to Figures 1A through 1I of the instant application does not represent "prior art" as to appellants. The figures clearly state "PRIOR ART," and the accompanying written description is not inconsistent with a conclusion that the drawings mean what they say. In our view, mere attorney arguments are not sufficient to overcome the presumption that the disclosure accurately reflects the status of the prior art. See In re Nomiya, 509 F.2d 566, 570-71, 184 USPQ 607, 611-12 (CCPA 1975) (by filing an application containing figures labeled as prior art, and statements explanatory thereof, appellants conceded what was to be considered as prior art in determining obviousness of their improvement).

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advantage to be derived from combining their teachings. In re Sernaker, 702 F.2d 989, 995-96, 217 USPQ 1, 6-7 (Fed. Cir. 1983).

CONCLUSION

The rejection of claim 1 under 35 U.S.C. § 102 as being anticipated by Xing is affirmed. The rejection of claims 3 and 4 under 35 U.S.C. § 103 as being unpatentable over Xing and the APA is reversed.

The examiner's decision in rejecting claims 1, 3, and 4 is thus affirmed-in-part.


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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

Lee E. Barrett
LEE E. BARRETT
Administrative Patent Judge


JOSEPH F. RUGGIERO
Administrative Patent Judge


HOWARD B. BLANKENSHIP
Administrative Patent Judge

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